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ABSTRACT

This study assessed the impact of an explicit goal to remember and thematic organization on the strategic behavior and recall performance of preschoolers. A total of 41 subjects were instructed either to remember 12 items for later "purchase" at a play store or to play with them. The items for half the children in each condition were linked to a beach picnic theme, while the alternate array was comprised of familiar but unrelated objects. Children in the play condition spent considerable time physically engaged with the items, in contrast to children in the "remember group" who did not directly interact with the objects, but intermittently looked at and named them. Differences in the behaviors of the two groups and the nature of the behaviors of the children in the "remember group" suggested that precursors of mnemonic strategies are available to preschoolers. However, only naming of items was predictive of recall. Item organization did not affect immediate recall scores. Only children exposed to the beach array maintained their level of recall after a 1-week delay interval. It is concluded that the data are compatible with the notion that schemas influence retrieval rather than encoding. (Author/RH)

Effect of Task Goal and Item Organization on Immediate and Delayed Recall

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Abstract

The effectiveness of strategies in enhancing memory performance has been well documented but the issue of whether young children can demonstrate deliberate/strategic behavior remains unresolved. This study assessed the impact of an explicit goal to remember and thematic organization on the strategic behavior and recall performance of preschoolers.

Forty-one preschoolers were instructed either to remember 12 items for later "purchase" at a play store or to play with them. The items for half the children in each condition were linked to a beach picnic theme and the alternate array was comprised of familiar but unrelated objects.

Children in the play condition spent considerable time physically engaged with the items in contrast to the remember group who did not directly interact with the objects but intermittently looked at and named the items. Differences in the behaviors of the two groups and the nature of the behaviors of the remember children, suggest that precursors of mnemonic strategies are available to preschoolers. However, only naming of items was predictive of recall. Item organization did not affect immediate recall scores, but only children exposed to the beach array maintained their level of recall following the one-week delay interval. The data are compatible with the notion that schemas influence retrieval rather than encoding.

Effect of Task Goal and Item Organization on Immediate and Delayed Recall

The development of strategies for remembering--including the issue of whether young children can be said to be strategic--and the role of knowledge in remembering, are central issues in contemporary developmental memory research. Typically, the approach has been to emphasize either strategies or knowledge as the major factor in the development of memory, with the interplay between the two receiving relatively little attention, especially with very young children. As Ornstein and Naus (1985) suggest, the use and effectiveness of mnemonic strategies should be facilitated when information to be remembered is presented in a manner consistent with the knowledge organization of the rememberer. This study applies this perspective to the preschool-age child.

Major Questions

1. Do preschoolers behave deliberately/ strategically when the mnemonic goal is explicit and the task is meaningful?
2. Does the use of emerging mnemonic strategies by preschoolers lead to more effective remembering?
3. Do children who are presented with items that are organized in ways that match the scripted knowledge

structures of the young child remember more than children whose items are organized into more traditional taxonomic categories?

4. Is the use and effectiveness of preschoolers' strategic behavior facilitated when information is presented in a manner consistent with their knowledge organization?
5. Are there differential patterns of remembering over time as a function of the goal of the task (remember or play) and item organization (scripted or non-scripted)?

Method

Design

Preschoolers were instructed either to remember or to play with a set of items linked to a familiar script (beach picnic) or to unrelated but equally familiar items.

The resulting four treatment groups were Remember Beach, Play Beach, Remember Non-Beach, and Play Non-Beach.

Recall was tested immediately after exposure to the items and again one week later.

Subjects

The subjects were 41 low-income Hawaiian children (23 boys and 18 girls) attending Kamehameha preschools (mean age = 4 years 3 months).

Task and Procedure

The items for the Beach and Non-Beach conditions were 12 miniature, colorful, attractive toy objects. Children were asked to label the items to ensure that they knew what they were.

Children in the Remember conditions were told to remember the items for later "purchase" at a pretend store. Children in the Play conditions were told to play with the items to see if they liked them.

The instructions were followed by a two-minute exposure period.

At the end of the exposure period children from all conditions went to the store to "purchase" the items. Children had to specify all the items they remembered before the storekeeper gave them the complete set in a shopping bag.

The children then shared their purchases with the experimenter as each item was individually removed from the shopping bag.

One week later children returned to the store for delayed recall.

Behavior Codes

The entire session was videotaped. Each child's behavior during the exposure period was coded using a two digit system which captured the primary approach to the task at a given time (State) and the nature of the accompanying talk (Verbalization).

The state codes are similar to the activity period behaviors described by Baker-Ward, Ornstein, and Holden (1984).

The State codes were:

Play--attempts to use properties of the object

Link--combines items (e.g. putting hamburger on grill)

Contact--touches items

Visual Examination--looks at items

Pause--on-task behavior not included in another category

Off-Task--not engaged in any aspect of the task

The Verbalization codes specify various types of child comments and/or naming of items, and were coded along with the appropriate State. The primary data for all codes was duration of the behavior.

Results and Discussion

Effect of Task Goal and Item Organization on Recall Scores

Repeated measures analysis of variance were performed with two between subject variables (Goal and Item Organization) and one within-subject variable (Immediate and Delayed Recall). The means and standard deviations of the immediate and delayed recall scores for each experimental condition are presented in Table 1.

Although data for the Goal variable were in the expected direction, with the Remember group recalling more items ($M = 5.9$) than the Play group ($M = 4.8$), the main effect of Goal was only marginally significant ($p < .086$). Item Organization did not

affect immediate recall scores, but there was a significant Item Organization by Recall Trial interaction ($p < .017$). Children exposed to the Beach array maintained their average level of recall following the one-week delay interval, whereas the recall scores of children in the Non-Beach group declined. (See Figure 1).

Figure 2 plots individual scores at immediate and delayed recall trials. Two-thirds of the Beach subjects maintained or increased their scores between immediate and delayed recall, whereas two-thirds of the Non-Beach subjects recalled fewer items at delayed recall than they had immediately. Thus the delayed effect of the beach script was robust and characteristic of the group as a whole.

The findings suggest that during immediate recall the saliency of the individual items was sufficient to produce comparable levels of recall between the Beach and Non-Beach groups. However, following the one-week delay, with recency of exposure no longer aiding recall, children in the Non-Beach group had to rely on memory of individual items. In contrast, children who had been exposed to the scripted set could use the beach theme to trigger recall of the array. The data are compatible with the notion that schemas influence retrieval rather than encoding (Alba & Hasher, 1983).

Another possible explanation for the high level of delayed recall for the Beach group is that children were merely naming items that they associate with the beach, rather than remembering

the experimental array. If that were the case, one would predict that some of their responses would include beach items not in the experimental set. Since no child ever "remembered" a beach item which was not presented, it seems quite clear that children were recalling the specific items they had seen during the experiment.

The Goal x Item Organization interaction was not significant. However, since an a priori hypothesis was that the Remember Beach group would recall the most items, subsequent t-tests comparing this group and each of the other groups were conducted. Figure 3 graphically presents recall scores of each experimental group averaged over immediate and delayed recall. The trend was in the expected direction with children in the Remember Beach group recalling the most items (M = 6.3) and those in the Play Non-Beach group remembering the fewest items (M = 4.7). Although the Remember Beach group did not recall significantly more items than the Remember Non-Beach group, comparisons with the and Play Beach ($p < .068$), and Play Non-Beach groups ($p < .084$) were marginally significant.

Effect of Remember and Play Instructions on Behavior

One question of interest was whether the instruction to remember evoked deliberate mnemonic behaviors. Figure 4 compares the behaviors of the Remember and Play groups.

Children asked to remember behaved dramatically differently during the exposure period from those requested to play. They spent their time engaged in the behaviors that most closely

resemble mature mnemonic strategies: Naming, Visual Examination, and Pausing. The nature of their behaviors suggests that these children were making deliberate attempts to remember, a first step in the development of mnemonic strategies.

Relationship between Exposure Period Behaviors and Recall

To explore the question of whether children's behaviors during the exposure period were linked to recall, a regression analysis was carried out using a stepwise selection procedure. The behavior variables included in the regression analysis were durations for all the State and Verbalization codes as well as the demographic variables of sex and age.

The one predictor of both immediate and delayed recall was the duration of Naming during any State. R^2 for immediate recall was .15 ($p < .014$); the comparable figures for delayed recall were $R^2 = .11$ ($p < .03$).

Although the behaviors of the Remember group seemed to be an appropriate response to the need to remember, only duration of Naming was predictive of recall. However, some children who did not name also remembered very effectively. Looking at patterns of behavioral variables or sequences of responses rather than individual variables would provide additional insight into the cognitive processing that was linked to recall.

Conclusions

The development of young children's memory with respect to both the emergence of mnemonic strategies and their ability to

encode and retain material as a function of the organization of the stimulus materials has been explored in this study.

Following Wellman's (1977) three part formulation of the differentiation experiment to evaluate whether a behavior is strategic, it seems reasonable to conclude that behaviors exhibited by the children given the goal of remembering, were indeed deliberate and represent precursors of more mature strategic behavior. Specifically, this experiment involved:

1) contrasting conditions in which one group was instructed to remember and a second group essentially served as a control (Remember versus Play)
2) potentially strategic activities occurred primarily within the Remember condition, (e.g. Naming, Visual Examination, Pause)
3) the activities of children instructed to remember enhanced recall (e.g. Naming).

It is becoming increasingly clear that mnemonic deliberateness is an evolving process and precursors of mature strategic behavior can be demonstrated in the early years as a function of the context of the task, the specific task demands, and the nature of the information that is to be remembered. The influence of content organization on recall was addressed in this study through the Item Organization manipulation (Beach versus Non-Beach). The finding that information that is compatible with the schematic knowledge structures of preschoolers is retained over time warrants further study.

Selected References

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Ornstein, P.A. & Naus, M. (1985). Effects of the knowledge base on children's memory strategies. In Advances in Child Development and Behavior, Volume 19, (pp.113-148). New York: Academic Press.

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Table 1

Means and Standard Deviations
for Immediate and Delayed Recall Scores

		Recall Period			
		Immediate		Delayed	
Condition	n	M	SD	M	SD
Remember					
Beach	10	6.4	2.5	6.2	2.1
Non-beach	11	5.9	1.2	5.1	1.2
Play					
Beach	11	4.8	2.0	4.9	2.3
Non-beach	9	5.4	3.0	4.0	2.0

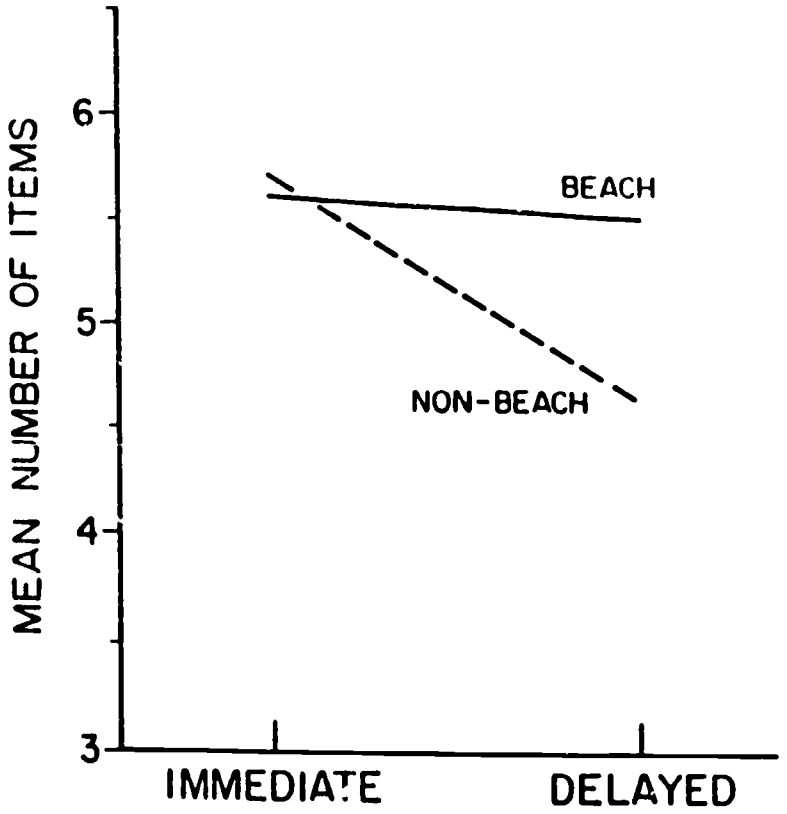

Figure 1. Mean number of items recalled during immediate and delayed tests as a function of item organization for remember and play groups combined.

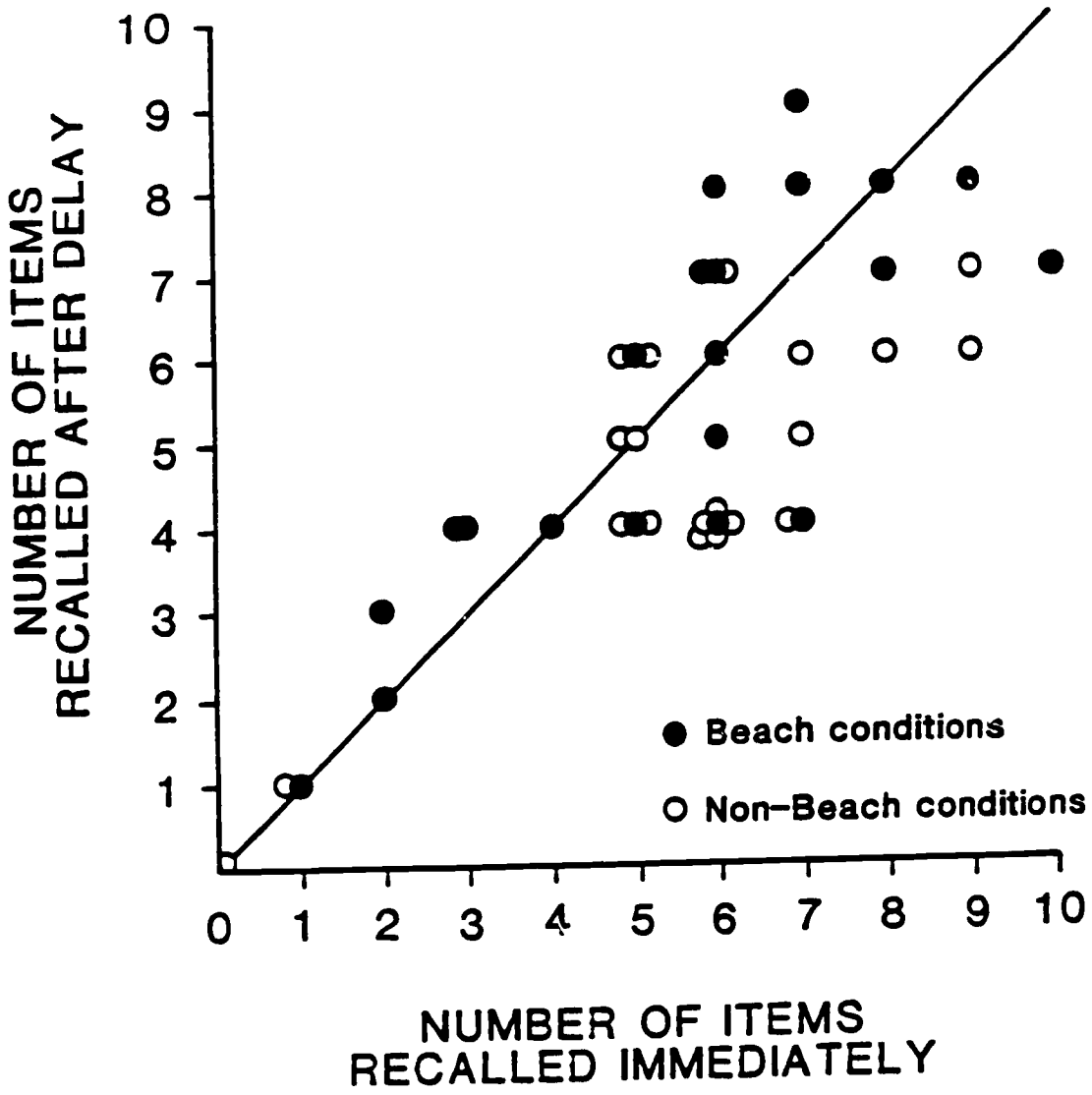

Figure 2. Scatter plot of immediate by delayed recall scores for beach versus non-beach conditions.

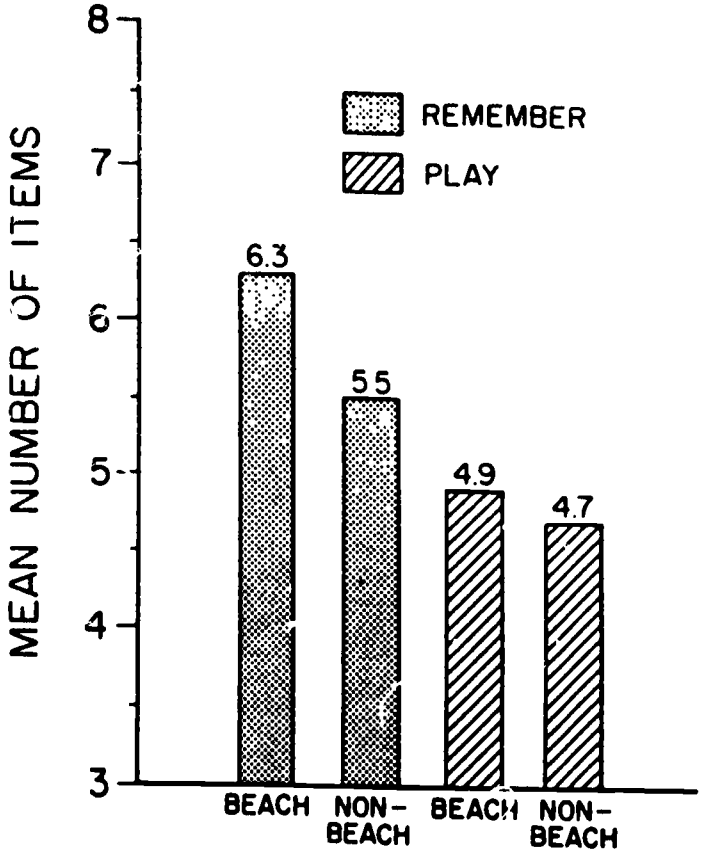

Figure 3. Mean number of items recalled as a function of goal (remember vs. play) and theme (beach vs. non-beach). Data are for both recall trials combined.

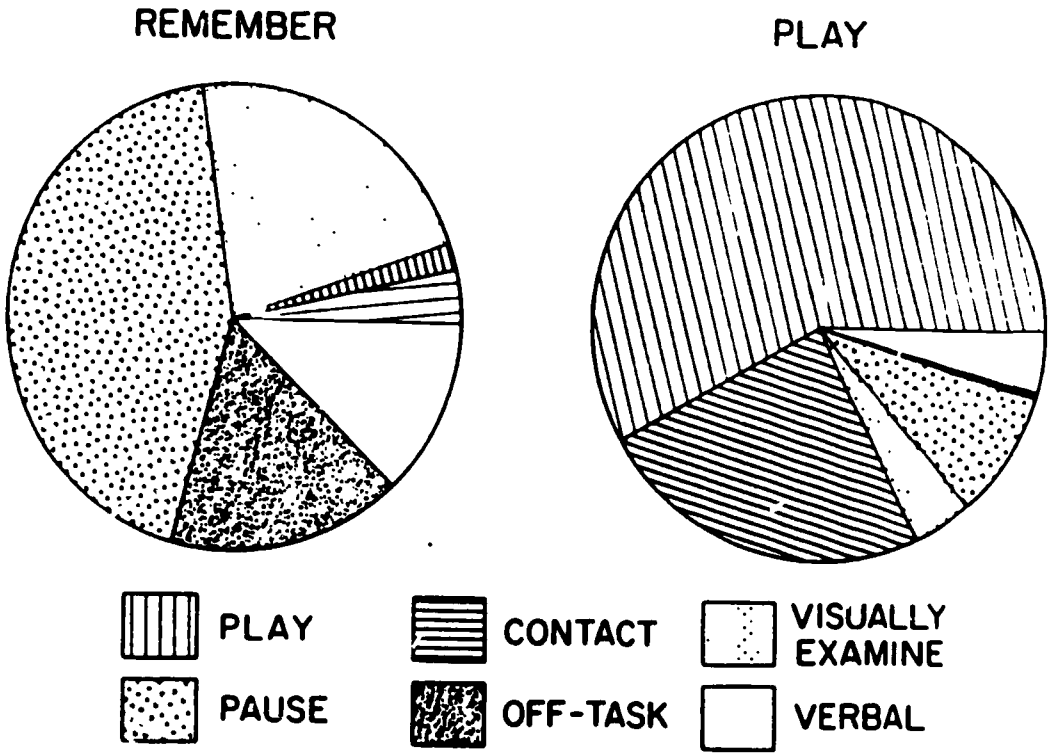

Figure 4. Mean duration spent in each of the indicated behaviors during the two-minute exposure period by the remember and play groups.